**Giant covalent structures**

Read pages 168 to 173 in your textbook on the allotropes of carbon and on silicon and silicon dioxide.

1. Identify similarities in the structure and bonding of graphite, diamond and fullerenes.
2. Identify differences in the structure and bonding of graphite, diamond and fullerenes.
3. Using structure and bonding, explain why graphite:
   1. Conducts electricity
   2. Is soft and slippery
   3. Has a very high melting and boiling point
4. Using structure and bonding, explain why graphene:
   1. Is strong
   2. Is flexible
   3. Has a very high melting and boiling point
5. Using structure and bonding, explain why diamond:
   1. Is very hard
   2. Does not conduct electricity
   3. Has a very high melting and boiling point
6. Which carbon allotrope does not have a very high melting and boiling point? Explain your answer.
7. Explain why graphite and graphene are better conductors than fullerenes.
8. Why is the formula unit of silicon dioxide SiO2?
9. Identify similarities and differences between diamond and silicon and explain them.